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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

09/830,030

**Applicant(s)**

ICHIKAWA ET AL.

**Examiner**

JENNIFER A. LEUNG

**Art Unit**

1797

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 October 2007 and 21 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 4-32 and 34 is/are pending in the application.
- 4a) Of the above claim(s) 12-15, 19-32 and 34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 4-11 and 16-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 October 2007 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's amendment filed on October 9, 2007 and Applicant's response to a Notice of Non-Compliant Amendment filed on December 21, 2007 have been carefully considered. Claims 2, 3, 33, 35 and 36 are cancelled. Claims 12-15, 19-32 and 34 are withdrawn. Claims 1, 4-11 and 16-18 are under consideration.

### ***Specification and Drawings***

2. The amendment filed October 9, 2007 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The new drawing in FIG. 28B and its corresponding description in the amended specification are not supported by the original disclosure. In particular, the original disclosure does not provide support for an embodiment where undulated walls are combined with flat walls, with the undulated walls being "out-of-phase" with one another (i.e., where each recession faces an opposite recession, and each protrusion faces an opposite protrusion).

Applicant states that, "[s]upport for this amendment can be found throughout applicants' specification, for example, at pages 9, 18, 25, 26, and 31-32." (see response; page 14, first paragraph). However, it is noted that for each embodiment where undulated walls are combined with flat walls (see embodiments shown in FIGs. 3 and 4; also, specification page 31, line 13 to page 33, line 18), the undulated walls are always "in-phase" with one another (i.e., where each recession faces an opposite protrusion).

Applicant is required to cancel the new matter in the reply to this Office Action.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 4-11 and 16-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 1, it is unclear as to where the newly added limitation of, “recessions and protrusions on one first wall face portion and recessions and protrusions on an adjacent first wall face portion are positioned... (1) with the protrusions of each facing one another and the recessions of each facing on another... and a second flat wall face portion located between each adjacent pair of undulated first wall face portions,” is supported in the original disclosure.

In particular, the original disclosure does not provide support for an embodiment where undulated walls are combined with flat walls, with the undulated walls being “out-of-phase” with one another (i.e., where each recession faces an opposite recession, and each protrusion faces an opposite protrusion). It is noted that for each embodiment where undulated walls are combined with flat walls (see embodiments shown in FIGS. 3 and 4; also, specification page 31, line 13 to

page 33, line 18), the undulated walls are always “in-phase” with one another (i.e., each recession faces an opposite protrusion).

4. Claims 1, 4-11 and 16-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, it is unclear as to which wall portions are being referred to by “an adjacent first wall face portion” (see line 13) and “each adjacent pair of undulated first wall face portions” (see line 16), since the first wall face portions do not appear to be “adjacent” to one another. It is unclear as to whether applicant intended to recite --an *opposing* first wall face portion-- and --each *opposing* pair of undulated first wall face portions--.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 4 and 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Hamada (JP 05-123580).

Regarding claims 1, 4 and 7, Hamada discloses a honeycomb structure having a plurality of cell passages defining a cell passage direction which are mutually parallel in the cell passage direction; wherein,

(1) intersection portions between walls defining said cell passages have a predetermined pitch in cross-sections perpendicular to said cell passages and are located in a pattern; (2) first

wall face portions of said walls excluding said intersection portions have an undulated shape in both the cell passage direction and the cross-sectional direction perpendicular to said cell passage direction; and (3) for each cell passage, the first wall face portions of an opposing pair of said walls extending in the cell passage direction both have an undulated shape, such that recessions and protrusions on one first wall face portion and recessions and protrusions on an adjacent (opposite?) first wall face portion are positioned with the protrusions of one of said wall face portions facing recessions of the other (see, e.g., abstract, FIGs. 1-3 and machine translation). In addition, the plurality of cell passages (e.g., the plurality of cell passages located at the center of the structure and along the x- and y-axes of the structure, as shown in FIGs. 2a and 2b) further comprise a second flat wall face portion located between each adjacent (opposing?) pair of undulated first wall face portions (see machine translation of section [0022]).

Regarding claim 8, the cell passages formed by said wall face portions of said walls having an undulated shape and cell passages defined by said wall face portions of said walls having a flat shape coexist in a discontinuous manner (see FIGs. 2(a),(b)).

Regarding claim 9, the honeycomb structure has a center portion (i.e., center section) surrounded by an outer portion (i.e., periphery section), the center portion comprising cell passages defined by undulated wall face portions; the outer portion comprising cell passages defined by flat wall face portions, the thickness of the wall of the cell passages at the outer portion is greater than that of the wall of the cell passages at the center portion (see, for example, sections [0019] and [0021]; FIGs. 2(a),(b)).

Instant claims 1, 4 and 7-9 structurally read on the apparatus of Hamada.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamada (JP 05-123580) in view of Yutake et al. (GB 2,071,640) and Maus et al (WO 96/12876 corresponding to US 6,274,099).

Hamada is silent as to the honeycomb structure comprising an undulated deformation that is greater at the outer portion than at the center portion. Yutake et al. teaches the provision of a honeycomb structure having the channels in the outer region clogged for improving the thermal insulation. Maus et al. teaches the provision of a honeycomb structure having a greater deformation at its outer region, which closes off the channels in the outer region (see column 4, lines 32-55). It would have been obvious to one having ordinary skill in the art to configure the

honeycomb structure of Hamada so that the deformation at the outer region is greater than at the center region, so as to improve the thermal insulation of the structure as taught by Yutake et al. and Maus et al.

7. Claims 6, 10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamada (JP 05-123580).

Regarding claim 6, the amplitude of the undulated wall appears to be at least 150% the thickness of the wall (see Hamada, for example, Figs. 1-2). Hamada also discloses that the amplitude may be such that the wave height is 0.5 mm or more (see section [0020]). Although an amplitude of at least 150% of the thickness of the wall is not specifically stated, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select an appropriate amplitude for the undulations relative to the thickness of the walls, on the basis of suitability for the intended use thereof, because where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

Regarding claim 10, Hamada discloses that the honeycomb structure may be made from a variety of materials, including ceramics and activated carbon (see section [0032]). It would have been obvious for one of ordinary skill in the art at the time the invention was made to select a claimed material (e.g., ceramics such as cordierite or alumina, etc., or an activated carbon such as adsorbent activated charcoal) for forming the honeycomb structure in the modified apparatus of Hamada, on the basis of suitability for the intended use thereof, because the claimed materials are conventional in the art as honeycomb making.

Regarding claim 16, discloses that the honeycomb structure has an undulated surface for



increasing the surface area, and may carry a catalyst on the surface thereof for purifying exhaust gas (see section [0020]). Placing the honeycomb structure in a housing (e.g., when incorporated as a converter; see section [0044]) is inherent therein.

8. Claims 11 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamada (JP 05-123580) in view of Abe et al. (US 5,459,119).

Hamada is silent as to the honeycomb structure having the claimed wall thickness and porosity. Abe et al., however, teaches a honeycomb structure having the claimed wall thickness and porosity (see column 7, lines 31-46). Furthermore, the specific wall thickness and porosity of the honeycomb structure are not considered to confer patentability to the claim, since the precise wall thickness and porosity of the honeycomb structure would have been considered a result effective variable by one having ordinary skill in the art. As such, without more, the claimed wall thickness and porosity of the honeycomb structure cannot be considered "critical". Accordingly, one having ordinary skill in the art would have routinely optimized the wall thickness and porosity of the honeycomb structure in the apparatus of Hamada to obtain a desired level of exhaust gas purification, as suggested by Abe et al, and where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

9. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamada (JP 05-123580) in view of Sugita et al. (JP 10-059784).

Hamada is silent as to the honeycomb structure having the instantly claimed cell density. Sugita et al., however, teaches the provision of an undulated-wall honeycomb structure having a plurality of cell passages, wherein the cell density is normally 280 cpsi (see abstract).

It would have been obvious to one having ordinary skill in the art to select an appropriate cell density, such as the cell density taught by Sugita et al., for the honeycomb structure of Hamada, in order to obtain the desired purification of exhaust gas, on the basis of its suitability for the intended use as a matter of obvious design choice, and where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

***Response to Arguments***

10. Applicant's arguments filed October 9, 2007 have been fully considered but they are not persuasive. Applicant (at page 17, 4-6) argues,

“Hamada describes a formation of undulated walls as well as flat walls (see for example, Hamada, Figs. 1-3). But Hamada does not disclose, teach, or suggest, a flat wall located between each adjacent pair of undulated first wall face portions.”

The Examiner respectfully disagrees. Applicant appears to argue that Hamada fails to disclose a honeycomb structure having the claimed configuration of undulated walls in combination with flat walls (i.e., where a flat wall is disposed between opposing undulated walls), since the flat wall/undulated wall configuration is not provided throughout the entire honeycomb structure in Hamada (see FIGs. 2(a), (b)). However, this argument is not found persuasive, since it is noted that claim 1 only requires that “a plurality of cell passages” (i.e., two or more cell passages) be provided with such a configuration. The claim does not require *all* cell passages to be provided with the flat wall/undulated wall configuration. In fact, claim 9 further suggests that this is not the case, since the claim calls for a center portion to comprise cell passages defined by walls of an undulated shape, and a separately configured outer portion to comprise cell passages defined by walls of a flat shape.

Applicant (at page 17, lines 6-12) further argues,

“... Hamada teaches a structure wherein the shape of the cross-section taken at arbitrary positions along (or parallel to) the cell passage direction is the same. Accordingly, the flow of liquid within the cell passage of Hamada is a stationary flow. Hamada describes a structure in which recessions and protrusions face one another in both the vertical and horizontal walls, which causes problems with purification capabilities associated with a stationary gas flow, which is distinguished from applicants' claimed invention (see applicants' specification, page 29, lines 9-15).”

The Examiner respectfully disagrees. It appears that Applicant is arguing that the honeycomb structure of Hamada differs from the instantly claimed honeycomb structure, since the Hamada honeycomb structure defines a “stationary flow” along the length of the cell passage. As suggested by Applicant's specification (see page 6, lines 15-23), a stationary flow occurs when the shape of the cross-section at arbitrary positions along the cell passage are the same. However, this is not the case in the Hamada cell passage. As seen in FIG. 2(b), the combination of an undulated wall and a flat opposing wall (e.g., at the central axis of the honeycomb structure) creates a changing cross-sectional area of the cell passage along the direction of flow. Thus, the flow of fluid in a cell passage defined by both undulated and flat wall portions would not be “stationary”.

### ***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

\* \* \*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER A. LEUNG whose telephone number is (571)272-1449. The examiner can normally be reached on 9:30 am - 5:30 pm Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jennifer A. Leung/  
Primary Examiner, Art Unit 1797